

# Partnering to Reduce Risk and Accelerate Development

## Read About

The advantages of choosing the right vendor partner

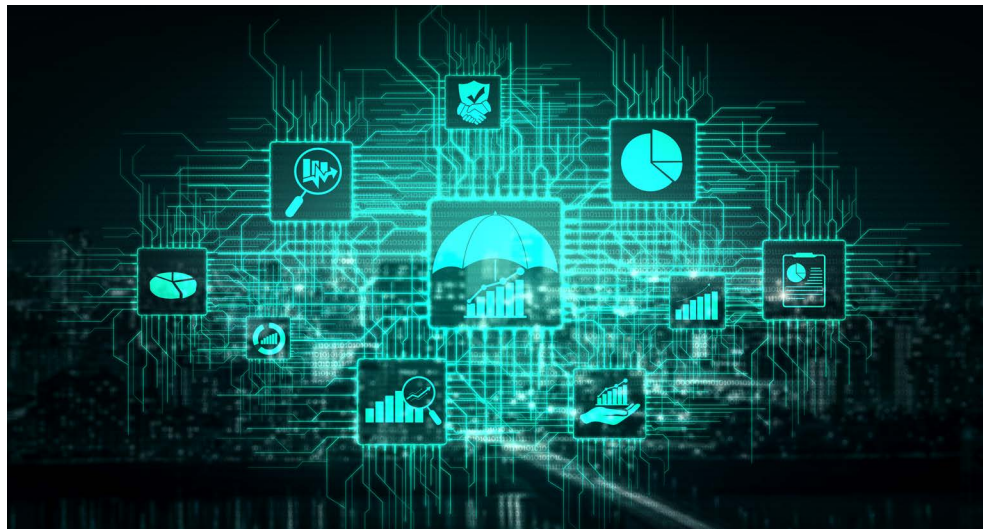
Capabilities to look for in the ideal vendor partner

Effective use of development systems

How to choose the right vendor partner

## Introduction

The landscape for system integrators in the defense and aerospace industries has changed considerably over the last few years. Today, many in-house teams find themselves trying to deliver the same scope of work they did in the past but in less time and at a lower cost. Budgets are 30 to 40 percent lower than they were just five years ago, and lead times can be 50 percent shorter.



At the same time, the need for system integrators to showcase their competitive advantage has increased. As a result, they're investing heavily in their own independent research and development (IRAD) to build demonstration units that will help elevate their technology readiness level (TRL) above that of the competition.

System integrators are very good at designing and building demonstration units. But, the significant time and money challenges they encounter when trying to get demonstration units to a level that will win a contract puts pressure on their operations and bottom line.

Leading solution vendors in the defense and aerospace industries have recognized the challenges their customers face and are ready to step in and help by providing some of the key capabilities needed to deliver differentiated demonstration units. They're also highly motivated to partner with their customers for mutual success.

When system integrators partner with a trusted and proven solution vendor, they are freed from the time commitment and burden of trying to complete every development stage themselves. As a result, they are in a better position to accelerate time to market while keeping projects on spec, on time, and on budget.

With a joint approach to an increasingly challenging marketplace, both organizations have new opportunities to win more business, increase customer satisfaction, and strengthen their financial position.

## The Right Solution Vendor Offers Key Advantages

Solution Vendors have the experience, expertise, and tools needed to help their customers accelerate development and reduce risks.

### No Learning Curve

Vendors can provide their customers with deep technical knowledge about their own products as well as a clear understanding of how their solutions interoperate with third party solutions.

In many cases, vendors have designed, developed, and integrated variants of the underlying hardware components and software drivers for years. In some cases, their experience spans decades. As a result, they are already extremely familiar with the intricacies of the components and technologies involved. And, they can apply the many lessons learned during previous integration projects using the same components. This combination enables vendors to integrate complex electronics in a reliable way while still meeting tight deadlines.

Vendors' deep understanding and experience also gives them the ability to immediately address integration issues that arise with no need to rely on time-consuming requests for assistance.

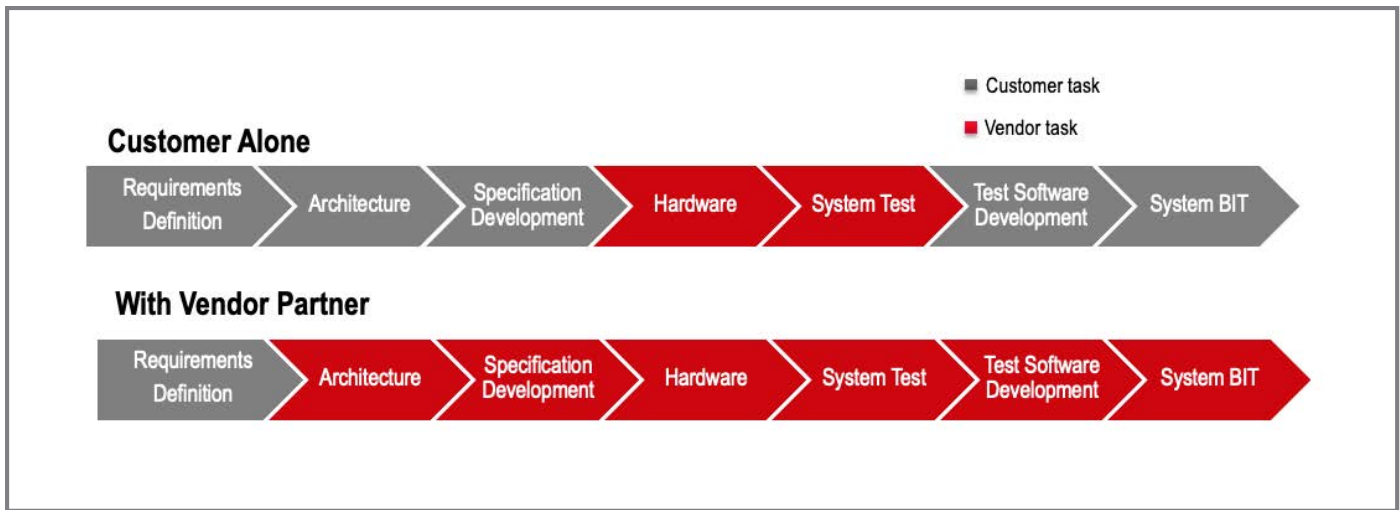
These advantages allow vendor partners to eliminate the learning curve that is typically required at the start of an integration project and dramatically reduce the time required to resolve issues along the way.

### Broad Knowledge of Standards and Technologies

A vendor's expertise and experience encompasses all of the critical competencies required to provide system integrators with stable, application-ready hardware platforms, including:

- + [Open architecture standards](#). Leading vendors are experts in the open standards that enable modular architectures and interoperability. Their expertise extends to OpenVPX, VPX, VME, FACE, FIPS 140-2, VICTORY, GVA, XMC, PMC, FMC, Compact PCI, PC104, PCI, and other key industry standards.

- + [Commercial off-the-shelf \(COTS\) technologies](#). Ruggedized and proven COTS technologies form the essential building blocks of almost every deployed system in defense and aerospace. A leading vendor can deliver cost-effective COTS technologies with the capabilities and artifacts required to meet the most challenging certification requirements, including DO-254 and DO-178 safety-certifiable avionics hardware.
- + **Backplane technologies**. As backplane speeds continually increase, technologies evolve. Leading vendors know how to implement and leverage a wide variety of high-speed backplane fabric switching technologies with highly optimized signal integrity.
- + [Power architectures](#). Vendors already understand the electrical interconnects, pinouts, voltage rails, and effects of power cycling for each hardware component in the overall system. And they have spent years innovating to minimize power requirements without sacrificing performance.
- + **Thermal management**. Leading vendors are experts in the thermal management considerations and techniques required by individual hardware components and integrated electronic systems. Their expertise includes understanding the magnitudes, power density, and effects of heat dissipation in electronic components as well as thermal flow implications and chassis cooling technologies.
- + [Ruggedized packaging](#). Leading vendors know what it takes to provide integrated systems warfighters can rely on for many years in the harshest field and environmental conditions. Their depth of understanding ranges from overall structural, mechanical, electrical, and environmental considerations to advanced techniques in solder joint reliability, interconnect density and reliability, and fault identification at microscopic levels.
- + **Military standards**. Vendors should employ environmentally qualified solutions that have been designed for harsh military environments. They should have the experience of taking systems through these qualifications successfully.



**Figure 1. Customer tasks without and with a vendor partner**

## Fewer Development Requirements

When a vendor can take on major development tasks, it minimizes the number of development stages their customers must tackle on their own. This support allows the customer to free up resources for other projects and takes considerable pressure off of project schedules.

Figure 1 shows the design phases system integrators can eliminate from their schedules when they partner with the right vendor.

Partnering with a vendor eliminates the customer's need to spend time and effort on

- + System architecture development
- + Specification development
- + Test software development
- + System built-in test (BIT)

## Key Capabilities to Look for in the Ideal Vendor Partner

Vendors who are in the best position to help their customers reduce risks and accelerate time to market combine approaches and tools that strengthen the strategic and operational aspects of system development. Here are four examples of the capabilities system integrators should look for as they evaluate potential vendors as partners.

## A Building Block Approach to System Development

The ability to easily combine the optimal set of ruggedized and proven modular hardware allows the vendor to jumpstart their customer's system development and speed system delivery.

Using proven, modular components provides the flexibility to

- + Integrate hardware components with the ideal size, weight, power, and cost (SWaP-C) for the target program
- + Easily tailor and adapt components to meet the most specific and challenging program and application requirements
- + Simplify technology insertion on any platform
- + Provide a seamless technology upgrade and migration path for the system when the time is right

To deliver high levels of speed, flexibility, and simplicity, vendors must offer a wide variety of ruggedized COTS products and solutions that comply with open industry standards. With a broad, standards-compliant portfolio, the vendor can mix and match components ranging from processing, graphics, networking, and input-output (IO) cards to power supplies, data recording devices, storage devices, mission displays, and other components in different enclosures and system configurations. The ideal vendor partner is able to design any missing technology that isn't available as building blocks.

## Sophisticated and Flexible Test Software

To enable their customers to immediately start focusing on the application when the integrated system is delivered, the vendor should eliminate the need for their customer to develop the test software needed for validation.

The ideal vendor will have developed sophisticated test software that can efficiently and effectively test all of the hardware interfaces. The test software must provide the flexibility to adapt

- + How tests are executed
- + Which tests are executed
- + Test sequences
- + The aspects of functionality — different data rates, for example — that are tested

The test software must provide the ability to make these changes dynamically, with no need to recode or recompile the test software. And, the software must work with all test equipment.

## Effective Use of Development Systems

Development systems include the hardware, software, and accessories needed to rapidly experiment with, and validate, system design and component interconnection options.

Vendors that take advantage of development systems have the best ability to accelerate delivery of demonstration systems and reduce startup costs. The best vendor partners can reduce lead times for delivery of ruggedized demonstration units by weeks, or even months. This accelerated delivery schedule allows the vendor's customer to almost immediately start benchmarking system performance and testing the system with their own application.

For the fastest path to application testing, look for a vendor that provides demonstration systems with mature test software and design verification test (DVT) capabilities.

## Choosing the Right Vendor Partner

As the trusted, proven leader in the defense and aerospace industries for many decades, Curtiss-Wright is ideally positioned to partner with system integrators.

With our deep expertise and experience, we bring our customers an unparalleled understanding of the strategies and technologies needed to get applications to market faster, with lower costs and fewer risks.

## Modular, Standards-Compliant Components

Curtiss-Wright's ruggedized and modular 3U VPX family includes a wide variety of open standards-compliant [processing](#), [graphics](#), [storage](#), I/O, and payload interface cards. The 3U cards can be combined as needed in

[multi-platform mission computing \(MPMC\)](#) chassis with different numbers of card slots and XMC sites, different cooling technologies, and different SWaP profiles. All chassis are qualified to MIL-STD-810 and MIL-STD-461 standards.

With the flexibility to mix and match standards-based, reusable cards and chassis in almost unlimited combinations, Curtiss-Wright can help their customers quickly and cost-effectively develop any number of systems, including

- + Fire control and vehicle computer systems that comply with VICTORY standards
- + Software defined radio systems
- + Display processing systems
- + Electronic warfare systems

## Advanced Capabilities that Significantly Reduce Timelines

To ensure we can help system integrators meet tight deadlines and cut costs throughout system development, we also provide sophisticated and flexible software that can reduce test software development time. Test software code can be changed in an hour or two, creating unprecedented levels of speed and agility for testing and validating hardware with any test equipment.

Our development systems allow us to take system integrators from initial concept to a ruggedized, program-specific demonstration unit in 12 weeks instead of the 24-, 36-, or 40-week timelines that are more common in the industry. Commercial-grade demonstration units that provide an inexpensive evaluation option can be delivered in as little as four to six weeks. The faster demonstration units are delivered, the sooner system integrators can start working on their applications.

## The Edge Needed to Win

When system integrators partner with Curtiss-Wright, they gain access to the capabilities, skills, and knowledge that comes from decades of experience.. They have a vendor partner who can help them overcome the time, cost, and technical challenges that have been steadily increasing in recent years to reduce risks and get to market faster.

**Author(s)**

**Jason DeChiaro**  
System Architect  
Curtiss-Wright Defense Solutions

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